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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/762,526	01/23/2004	Chang Won Choi	2557-000177/US	5346

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EXAMINER
LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
1763	

DATE MAILED: 06/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/762,526	CHOI ET AL.	
	Examiner	Art Unit	
	Jeffrie R. Lund	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 March 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) *40-43* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-39 and 44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 August 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/05, 2/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-39 and 44, in the reply filed on March 13, 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 30-39 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The limitation "edge bead electrode" is not described in the specification.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 30-39 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 30-39 are indefinite in that they contain the limitation "an edge bead electrode". It is not clear what this term means.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1, 2, 7, 12, 13, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Koshiishi et al, US Patent 5,919,332.

Koshiishi et al teaches a bottom electrode 6 arranged below the semiconductor wafer W and acting as a stage; a solid upper electrode 21 arranged above the semiconductor wafer; and insulating plate 31 arranged adjacent to the solid plate upper electrode 6 with a gap therebetween. The gap is formed at the junction of the electrode and the insulating plate. The insulating plate includes a protrusion with a sloped surface and a cliff surface. (Entire document, specifically, Figure 1)

7. Claims 1, 2, 7, 12, 13, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujimoto, US Patent 5,413,673.

Fujimoto teaches a bottom electrode 52 arranged below the semiconductor wafer 50 and acting as a stage; a solid upper electrode 51 arranged above the semiconductor wafer; and insulating plate 40 (42) arranged adjacent to the solid plate upper electrode 51 with a gap l_2 therebetween. The gap is formed at the junction of the electrode and the insulating plate. The insulating plate includes a protrusion with a sloped surface and a cliff surface. (Entire document, specifically, Figure 4 and 5)

8. Claims 1-8, 19, 20, and 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Quon, US Patent Applicant Publication 2003/0150562 A1.

Quon teaches a bottom electrode 20 arranged below the semiconductor wafer 14 and acting as a stage; a solid upper electrode 10 arranged above the semiconductor wafer; and insulating plate 80 arranged adjacent to the solid plate upper electrode 10 with a gap therebetween; an ring type upper electrode 30 above the wafer; and a lower edge electrode 40. The gap is formed at the junction of the electrode and the insulating plate. The specific electrodes used to form a plasma is an intended use of the apparatus and the apparatus of Quon is capable of forming the plasma as claimed. (Entire document, specifically, Figure 1)

9. Claims 1, 2, 7, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Kim et al, US Patent Applicant Publication 2003/0070760 A1.

Kim et al teaches a bottom electrode 155 arranged below the semiconductor wafer 154 and acting as a stage; a solid upper electrode 151 arranged above the semiconductor wafer; and insulating plate 142 arranged adjacent to the solid plate upper electrode 151 with a gap 153 therebetween. The gap is formed at the junction of the electrode and the insulating plate. The insulating plate includes a protrusion. (Entire document, specifically, Figure 2B)

10. Claims 1-4, 6, 17, and 18 are rejected under 35 U.S.C. 102(e) as being anticipated by Houghton et al, US Patent Applicant Publication 2004/0137745 A1.

Houghton et al teaches a bottom electrode 140 arranged below the semiconductor wafer 100 and acting as a stage and including a chuck; a solid upper electrode 145 arranged above the semiconductor wafer; and a ring type electrode 175 above and below the wafer. The chuck inherently includes a plurality of straight or

curved open grooves. The specific electrodes used to form a plasma is an intended use of the apparatus and the apparatus of Houghton et al is capable of forming the plasma as claimed. (Entire document, specifically, Figure 4) The distance between the wafer and the upper electrode is small enough to prevent a plasma from being formed.

11. Claim 44 is rejected under 35 U.S.C. 102(e) as being anticipated by Berman et al, US Patent 6,837,967 B1.

Berman et al teaches an insulating plate 120 includes a protrusion with a sloped surface and a cliff surface. (Entire document, specifically, Figure 2B)

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Quon, US Patent Application Publication 2003/0150562 A1 in view of Johnson, US Patent 2003/0201069 A1.

Quon was discussed above and includes a lower electrode and a lower ring electrode.

Quon differs from the present invention in that Quon does not teach an isolator between the lower electrode and lower ring electrode.

Johnson teaches a lower electrode 175, a lower ring shaped electrode 210, and an isolator 174 that isolates the lower electrode from the lower ring shaped electrode.

(Figure 1A and 1B)

The motivation for adding the isolator of Johnson to the apparatus of Quon is to isolate the lower electrode and lower ring type electrode to enable the independent control of the power supplied to each electrode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the isolator of Johnson to the apparatus of Quon.

14. Claims 5, 7, 8, 10, 11, 19-22, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Houghton et al, US Patent Application Publication 2004/0137745 A1, in view of Quon, US Patent Application Publication 2003/0150562 A1.

Houghton et al was discussed above.

Houghton et al differs from the present invention in that Houghton et al does not teach individual upper and lower ring type electrodes, or an insulating plate.

Quon was discussed above and includes upper and lower ring type electrodes and an insulating plate.

The motivation for replacing the ring electrode of Houghton et al with the ring electrodes and insulation plate of Quon is to replace the single ring electrode with an upper and lower electrode to give more control to where the plasma is formed as taught by Quon.

The motivation for adding the insulating plate of Quon to the apparatus of Houghton et al is to isolate the upper electrode and upper ring type electrode as taught by Quon.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the upper and lower ring type electrodes and insulating plate of Quon to the apparatus of Houghton et al.

15. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Houghton et al, US Patent Application Publication 2004/0137745 A1, and Quon, US Patent Application Publication 2003/0150562 A1, as applied to claims 5, 7, 8, 10, 11, 19-22, 28, and 29 above, and further in view of Johnson, US Patent Application Publication 2003/0201069 A1.

Houghton et al and Quon differs from the present invention in that they do not teach an isolator between the lower electrode and lower ring electrode.

Johnson teaches a lower electrode 175, a lower ring shaped electrode 210, and an isolator 174 that isolates the lower electrode from the lower ring shaped electrode. (Figure 1A and 1B)

The motivation for adding the isolator of Johnson to the apparatus of Houghton et al and Quon is to isolate the lower electrode and lower ring type electrode to enable the independent control of the power supplied to each electrode.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the isolator of Johnson to the apparatus of Houghton et al and Quon.

16. Claims 12-16, and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Houghton et al, US Patent Application Publication 2004/0137745 A1, and Quon, US Patent Application Publication 2003/0150562 A1, as applied to claims 5,

7, 8, 10, 11, 19-22, 28, and 29 above, and further in view of Koshiishi et al, US Patent 5,919,332.

Houghton et al and Quon differs from the present invention in that they do not teach that the insulating plate includes a protrusion with a sloping side and a cliff side that prevents plasma from flowing to the center of the wafer, or that variable sized plates.

Koshiishi et al was discussed above and includes insulating plate with a protrusion having a sloped surface and cliff surface. The protrusion controls the location of the plasma and prevents it passing from one section (i.e. inner or outer) to the other section (i.e. outer or inner).

The motivation for adding the protrusion of Koshiishi et al to the apparatus of Houghton et al and Quon is to control the location of the plasma as taught by Koshiishi.

The motivation for making the insulating plates of various sizes is to enable the control the location and extent of the plasma by changing the insulating plate.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the protrusion of Koshiishi to the apparatus of Houghton et al and Quon and to make the insulating plate in various sizes.

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited art teaches the technological background of the invention.

18. Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
6/2/06